

30.
Find
the pts.
 (x, y)
↑

$y = \tan x \quad -\frac{\pi}{2} < x < \frac{\pi}{2}$

$\tan \text{ line } \parallel y = 2x$

$y' = \text{slope} = 2$

solve $\sec^2 x = 2$

$\cos x = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$\cos x = \frac{\sqrt{2}}{2}$

$x = \frac{\pi}{4} \text{ or } -\frac{\pi}{4}$

$y = 1 \quad y = -1$

$\frac{1}{\cos^2 x} = 2$

$\cos^2 x = \frac{1}{2}$

$\cos x = \sqrt{\frac{1}{2}}$

Sep 21-9:29 AM

3.6a Chain Rule

Use chain.rules to discover the amazing chain rule for derivatives of
composite functions. - function of a function

$y = \overset{\text{out}}{\sin}(\overset{\text{in}}{5x})$

$y = f(g(x))$

$g(x) = 5x$

$f(x) = \sin x$

$y' = 5 \cos(5x)$

$x = \frac{\pi}{5}$

$g(\frac{\pi}{5}) = \pi$

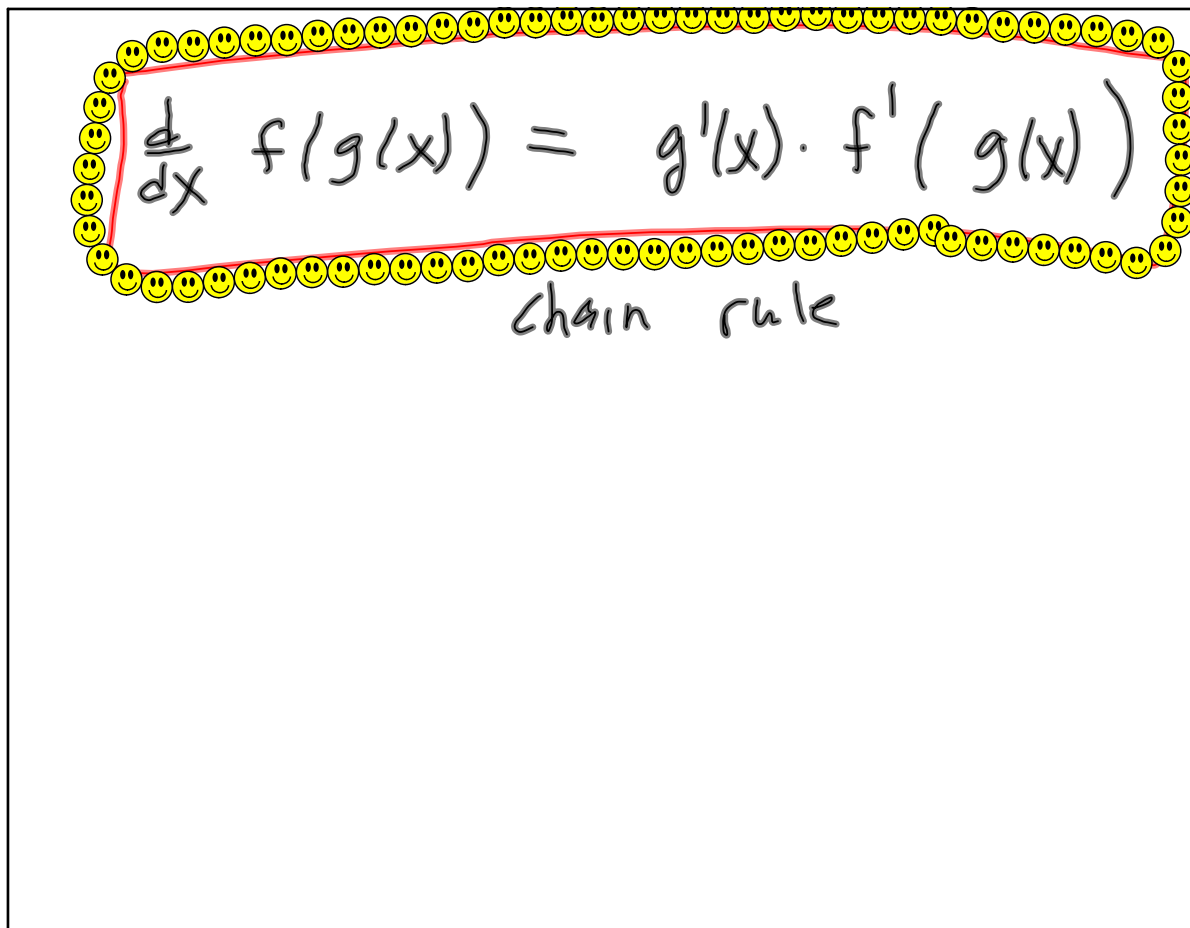
$f(\pi) = 0$

$f(g(\frac{\pi}{5})) = 0$

$\frac{d}{dx} \cos(x^3) = 3x^2 \cdot (-\sin(x^3))$

$= -3x^2 \sin(x^3)$

Sep 20-7:23 PM



The image shows a handwritten equation for the chain rule, $\frac{d}{dx} f(g(x)) = g'(x) \cdot f'(g(x))$, enclosed in a decorative border of yellow smiley faces. A red line underlines the entire equation. Below the equation, the words "chain rule" are written in cursive.

$$\frac{d}{dx} f(g(x)) = g'(x) \cdot f'(g(x))$$

chain rule

Sep 21-10:08 AM

If a particle moves along the x-axis so that its position is given by $x(t) = \cos(t^2 + 1)$, find the velocity.

$$x = \cos(t^2 + 1)$$

$$v = -2t \sin(t^2 + 1)$$

Sep 20-7:33 PM

Find dy/dx :

$$y = \sin(x^2 + x) \quad y' = (2x+1)\cos(x^2+x)$$

$$y = \sin^5 x = (\sin x)^5 \quad y' = \cos x \cdot 5(\sin x)^4$$

$$\text{in: } \sin x \quad \text{out: } x^5 \quad \text{der: } 5x^4$$

$$y = (x^3 + 2x - 1)^4$$

$$\text{in } x^3 + 2x - 1 \quad \text{der } 3x^2 + 2$$

$$\text{out } x^4 \quad \text{der } 4x^3$$

$$y' = (3x^2 + 2)4(x^3 + 2x - 1)^3$$

$$y = (x^3 - x)^5 \sin(3x)$$

$$y' = (x^3 - x)^5 3 \cos(3x) + \sin(3x) \cdot (3x^2 - 1) 5(x^3 - x)^4$$

Sep 20-7:35 PM

Oct 11-3:19 PM